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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,646	01/24/2002	Jeff Thornton	000515-237	3600

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EXAMINER

LEE, RIP A

ART UNIT PAPER NUMBER

1713

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/053,646	Applicant(s) THORNTON ET AL.	
	Examiner Rip A. Lee	Art Unit 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21,22 and 24-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 38 is/are allowed.
- 6) ☒ Claim(s) 21,22,24-30,35 and 39-45 is/are rejected.
- 7) ☒ Claim(s) 31-34, 36,37 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action follows a response filed on July 2, 2004. Applicants have amended claims 21, 24-26, 29, 31, 35, 37, 38, and 42. Claim 23 was canceled.

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

2. Claims 39 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form. Claim 39 is drawn to a process in which hydrophobic interaction between nitroxyl radical and solid sorbent takes place in a liquid-liquid extraction step. According to the specification, page 5, lines 20-23, this aspect of the invention occurs in *absence* of solid sorbent. As such, claim 39 fails to limit further the subject matter of claim 21. See also paragraph 4, *infra*.

Claim Rejections - 35 USC § 112

3. Claims 29 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The amended phrase, "high in comparison with the vapor pressure of water" remains vague and indefinite because the vapor pressure range is not specified unambiguously. Such a term includes values less than and greater than VP_{H_2O} . Furthermore, vapor pressure is a temperature dependent parameter. Consequently, citing vapor pressure without the corresponding temperature is meaningless.

4. Claims 39-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The relationship of the subject matter of claim 42 with that of independent claim 21 is not clear. Claim 42 is drawn to a process in which hydrophobic interaction between nitroxyl radical and solid sorbent takes place in a liquid-liquid extraction step. According to the specification, page 5, lines 20-23, organic solvent is added to a reaction mixture to remove TEMPO selectively in *absence* of solid sorbent. See also paragraph 2, *supra*.

Claim Rejections - 35 USC § 102

5. Claims 21-30 and 43-45 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,335,464 to Ochi *et al.* for the same reasons set forth in the previous office action.

Briefly, Ochi *et al.* discloses a process in which TEMPO is separated adsorptively from aqueous reaction mixture by addition of a synthetic resin such as Amberlite resin XAD-2 (Example 3). Example 5 shows that synthetic resins having TEMPO adsorbed thereon can be reused continually. These resins may be used as a stationary phase for chromatographic purposes (see Referential examples, cols. 10-11, and col. 6, lines 57-64). The amine oxide may be desorbed and recovered from the resin using water-miscible solvents such as THF, acetone, or lower alcohols (col. 7, lines 37-44).

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6. Claims 31-34, 36, and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 31-34 and 36 recite use of silica gel as the solid sorbent, and claim 37 is drawn to separating nitroxyl radical by hydrophobic interaction in a precipitation step. Neither of these aspects of the present invention is taught or reasonably suggested in Ochi *et al.*

7. Claim 38 is allowed over the cited prior art, as indicated in the previous office action. Claim 38 is drawn to a method in which nitroxyl radicals are recovered by dissolving β -cyclodextrin in a reaction mixture containing nitroxyl radical, thereby forming a nitroxyl-cyclodextrin complex which precipitates from the reaction mixture. Ochi *et al.* teaches separation of nitroxyl radicals by adsorption onto synthetic polymeric resins. As these materials are disparate from β -cyclodextrin, one having ordinary skill in the art would not have found it obvious to arrive at the claimed invention from the prior art.

Response to Arguments

8. Applicants traverse the rejection of claims 21-30 and 43-45 under 35 U.S.C. 102(e) as being anticipated by Ochi *et al.* Applicant's arguments have been considered fully, but they are not persuasive. Applicants submit that Ochi *et al.* does not teach the present invention because: (i) the prior art discloses selective oxidation using a resin having an amine oxide adsorbed therein, and (ii) stable nitroxyl radicals are not separated from a reaction mixture.

That the prior art teaches oxidation reaction is irrelevant to the claimed subject matter. However, Applicants have accepted the notion that the prior art discloses adsorption of nitroxyl radicals onto solid sorbent. Contrary to statement (ii), Ochi *et al.* does teach separation of nitroxyl radicals from a reaction mixture. As seen in Example 3, once oxidation has been performed, polyacrylic resin is added to the reaction mixture to adsorb TEMPO (col. 9, line 37). This in effect, constitutes separation from a reaction mixture because the resin containing TEMPO is filtered from the reaction mixture.

Should Applicants be concerned with the preamble in which the nitroxyl/silica combination be catalytically active, the examiner points to the rejection in which example 5 was cited to support this notion. Here, the patent shows that synthetic resins having TEMPO adsorbed thereon can be reused continually. That is, catalytic activity is retained since the nitroxyl radical has not been quenched.

In view of this and previous discussions, the rejection of record has not been withdrawn.

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9. Applicant's arguments with respect to the rejection of claims 31-36 as being unpatentable under 35 U.S.C. 103(a) over Ochi *et al.* in view of U.S. Patent No. 6,448,267 to Anggard *et al.* have been fully considered and are persuasive. Applicant have shown conclusively that there is no motivation to combine references. Therefore, the rejection has been withdrawn.

10. All previous claim objections and claim rejections under 35 U.S.C. 112, 2nd paragraph have been overcome appropriately by amendment.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Prior Art

The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure.

Kotake *et al.* (*J. Am. Chem. Soc.*, 1989) teaches inclusion of nitroxide radicals by a β -cyclodextrin in water. The complex remains in solution and the kinetics of inclusion were monitored spectroscopically. There is no teaching of use of β -cyclodextrin for separating nitroxides from solution by inclusion phenomena.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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September 13, 2004

TATYANA ZALUKAEVA
PRIMARY EXAMINER

